

Amendments to the Claims

This listing of claims replaces all prior versions, and listings, of claims in the present Application.

Listing of Claims:

Claims 1-14 (Canceled)

Claims 15-40 (Previously Canceled)

Claims 41-50 (Canceled)

51. (New) A device comprising:

- a manipulandum operable to be displaced in a degree of freedom;
- a means for sensing a displacement of said manipulandum in said degree of freedom;
- a means for selecting a mode associated with said displacement of said manipulandum in said degree of freedom, said mode comprising at least one of a position control mode and a rate control mode;
- an actuator operable to output a processor-controlled force sensation to said manipulandum, said force sensation associated with said mode; and

a processor operable to receive a sensing signal from said sensing means and to output to the actuator a control signal associated with the sensing signal, the control signal operable to cause said actuator to output the processor-controlled force sensation, said processor further operable to associate a value with a position of said manipulandum in said position control mode and to control a rate of change of said value in said rate control mode.

52. (New) The device as recited in claim 51, wherein said degree of freedom comprises a linear degree of freedom.

53. (New) The device as recited in claim 51, wherein said degree of freedom comprises a rotary degree of freedom.

54. (New) The device as recited in claim 53, wherein said manipulandum is operable to be displaced in a plurality of transverse directions with respect to an axis of said rotary degree of freedom.

55. (New) The device as recited in claim 54, wherein said sensing means comprises a hat switch comprising a plurality of individual switches, each of said individual

switches operable to detect a transverse position of said manipulandum in one of the plurality of said transverse directions.

56. (New) The device as recited in claim 51, wherein the processor is operable to control said force sensation in said rate control mode.

57. (New) The device as recited in claim 51, wherein said force sensation comprises at least one of a biasing force, a damping force, a texture force, a jolt, an obstruction force, an assistive force, a periodic force, and an end-of-travel force.

58. (New) The device as recited in claim 51, wherein said actuator is operable to output a force detent during said displacement of said manipulandum in said position control mode.

59. (New) The device as recited in claim 51, wherein said rate of change is associated with said displacement of said manipulandum with respect to a designated position of said manipulandum.

60. (New) The device as recited in claim 59, wherein said processor is operable to control a biasing force applied to said manipulandum in a direction toward said designated position in said rate control mode, and wherein a value of said rate of change comprises zero at said designated position.

61. (New) The device as recited in claim 51, wherein said processor is operable to control said position of said manipulandum in said rate control mode.

62. (New) The device as recited in claim 51, wherein the processor comprises a first processor and a second processor, the first processor operable to control the second processor.

63. (New) The device as recited in claim 51, wherein the degree of freedom comprises a first degree of freedom and a second degree of freedom.

64. (New) A method comprising:

providing a manipulandum;

providing an actuator operable to output a force to said manipulandum;

providing a sensor operable to detect a position of said manipulandum and to output a sensor signal, said sensor signal comprising information associated with said position; and

providing a processor operable to control said actuator and to receive said signal from said sensor, said processor operable to associate a value with said position of said manipulandum in a position control mode and to control a rate of change of said value in a rate control mode.

65. (New) A method comprising:

providing a manipulandum operable to be displaced in a first degree of freedom and a second degree of freedom;

providing a means for selecting a mode associated with a position of said manipulandum, said mode comprising at least one of a position control mode and a rate control mode;

providing an actuator operable to output a processor-controlled force sensation to said manipulandum, said force sensation associated with said mode; and

providing a processor operable to control said force sensation output from said actuator and to receive a signal from said sensing means, said first microprocessor operable to associate a value with a position of said manipulandum in said position control mode and to control a rate of change of said value in said rate control mode.

66. (New) A method comprising:

- providing a manipulandum operable to be displaced in a degree of freedom;
- providing a means for sensing a displacement of said manipulandum in said degree of freedom;
- providing a means for selecting a mode associated with said displacement of said manipulandum in said degree of freedom, said mode comprising at least one of a position control mode and a rate control mode;
- providing an actuator operable to output a processor-controlled force sensation to said manipulandum, said force sensation associated with said mode; and
- providing a processor operable to receive a sensing signal from said sensing means and to output to the actuator a control signal associated with the sensing signal, the control signal operable to cause said actuator to output the processor-controlled force sensation, said processor further operable to associate a value with a position of said manipulandum in said position control mode and to control a rate of change of said value in said rate control mode.